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## (54) A FRAME FOR A TRAILER VEHICLE

- (71) We, GRAUMBREMSE GmbH, a Company organised and existing under the laws of the Federal Republic of Germany of Eppelheimer Str. 76, 6900 Heidelberg, Federal Republic of Germany, do hereby declare the invention for which we pray that a Patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:-
- 10 The invention relates to a frame for a trailer vehicle, particularly a caravan, comprising longitudinal and transverse members and drawbar stays attached at an acute angle to the longitudinal members by flanges.
- 15 Such a frame structure for trailer vehicles has already been described in German Fed. Rep. Petty Patent No. 7 403 929. For joining the drawbar stays to the longitudinal members special connecting flanges are used.
- 20 These are attached on the one hand to the longitudinal members and on the other hand to the drawbar stays for instance by bolting. The use of connecting flanges necessitates the separate manufacture as well as a special assembly of these flanges. When using a
- 25 bolted connection between a connecting flange and a longitudinal member the section of the longitudinal member is necessarily weakened by the presence of the bolt holes.
- 30 It is an object of the present invention to improve the conventional frame of a trailer vehicle with regard to the connections between the longitudinal frame members and the drawbar stays by simplifying this connection and more particularly by increasing its strength.
- 35 According to the present invention, there is provided a trailer vehicle frame comprising a pair of longitudinal members interconnected by transverse members and including a pair of drawbar stays inclined towards each other and each mounted on a corresponding one of the longitudinal members at an acute angle thereto, a vertical web of each longitudinal member being deformed to form a
- bulge at each side of the web with a flat portion extending between the bulges and inclined to the longitudinal axis of the member at said acute angle, the corresponding drawbar stay seating on said flat portion and being secured thereto.
- 50 In order to minimise the specific deformation these bulges may project to opposite sides of the web to the same extent. This permits the resultant connecting flange to be fairly elongated and to provide a reliable support by reason of the considerable length of the contacting surface between the drawbar stays and the longitudinal member.
- 55 Each deformation may merge all round into the material of the corresponding vertical web or possibly may merge at one side into the material of a horizontal flange of the corresponding longitudinal member. Alternatively the material of the vertical web may be partly perforated prior to the creation of the deformation to facilitate forming these bulges, but in such a case the strength of the member will only be slightly improved.
- 60 The flat portion of the deformation of each longitudinal member is preferably provided with a hole which is inturned to define a projection which fits into a corresponding larger diameter hole in the respective drawbar stay. In a modification, the hole with the inturned edge is provided in the drawbar stay and the projection so defined fits into a larger diameter hole in the respective longitudinal member. This improves strength and facilitates assembly because the projections also have a centring action. A plurality of such
- 65 holes are preferably provided, each receiving a bolt connecting the stays to the respective longitudinal members. However, the projections would be useful if the join was made by welding, instead of by bolts.
- 70 Reference is now made to the accompanying drawings, wherein:-
- 75 Fig. 1 is a view from above of the frame of a trailer vehicle,
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- 85
- 90

Fig. 2 is a side view of the frame of the trailer vehicle, and

Fig. 3 is a horizontal section through the joint between a longitudinal member and a drawbar stay.

The vehicle frame consists of longitudinal members 1 which are divided, and of transverse members 2 and 3. There is at least one axle 4 which may be a rubber spring axle in an external axle tube 5. At each end the axle tube 5 carries an axle plate 6 to which a longitudinal member 1 is attached by means of bolts 7.

Moreover, drawbar stays 8 unite at their leading end to form a coupling head 9, whereas their rear ends are bolted to the longitudinal members 1 of the frame as well as being bolted intermediate their ends to the front end transverse member 2.

It will be understood by reference to Fig. 2 that each longitudinal member 1 is equivalent to two cantilever arms of constant flexural strength. This means that the height of the vertical webs of these members is greater at the axle 4 than at the ends connected to the transverse member 2.

The connection between the longitudinal member 1 and the drawbar stay 8 is shown in Fig. 3. For making this connection the vertical web of each longitudinal member 1 is deformed to form a kind of corrugation 10 which is so located and contrived that it can serve as a connecting flange for the attachment to the longitudinal member of the drawbar stay 8 at an acute angle. This deformation 10 has bulges at 11 which project symmetrically to each side of the web. The deformation merges all round into the material of the vertical web or may possibly merge at one side into the material of the horizontal flange of the longitudinal member 1. The special provision and affixation of a connecting flange is thus rendered unnecessary.

Moreover, where each connecting bolt 13 is to be provided the bolt hole edge may be inturned to define an annular projection 12, firstly in order to strengthen the edge and secondly to ensure an improved and tight joint. The annular projection 12 fits in a larger diameter hole 14 in the corresponding drawbar stay. The projection may be frustoconical to provide a tight fit in the hole 14 due to deformation of the projection when the bolt 13 is made tight. Any clearance between the interengaging parts will thus be eliminated.

#### WHAT WE CLAIM IS:-

1. A trailer vehicle frame comprising a pair of longitudinal members interconnected by transverse members and including a pair of drawbar stays inclined towards each other and each mounted on a corresponding one of the longitudinal members at an acute angle thereto, a vertical web of each longitudinal member being deformed to form a bulge at each side of the web with a flat portion extending between the bulges and inclined to the longitudinal axis of the member at said acute angle, the corresponding drawbar stay seating on said flat portion and being secured thereto.

2. A frame according to Claim 1, wherein each bulge projects to each side of the web to the same extent.

3. A frame according to Claim 1 or 2, wherein each deformation merges all-round into the material of the respective vertical web.

4. A frame according to Claim 1 or 2, wherein each deformation merges all-round into the material of the respective vertical web except at one side, where the deformation merges into the material of a horizontal flange of the respective longitudinal member.

5. A frame according to any preceding Claim, wherein the flat portion of the deformation of each longitudinal member is provided with a hole the edge of which is inturned to define a projection which fits into a corresponding larger diameter hole in the respective drawbar stay.

6. A modification of the frame according to Claim 5 in which the hole with the incurved edge defining a projection is provided in the drawbar stay and the projection fits into a corresponding larger diameter hole in the respective longitudinal member.

7. A frame according to Claim 5 or 6, wherein a plurality of said holes are provided, each receiving a bolt connecting the stays to the respective longitudinal members.

8. A frame according to Claim 5, 6 or 7, wherein each projection is frustoconical.

9. A trailer vehicle constructed substantially as herein described with particular reference to Figure 3 of the accompanying drawings.

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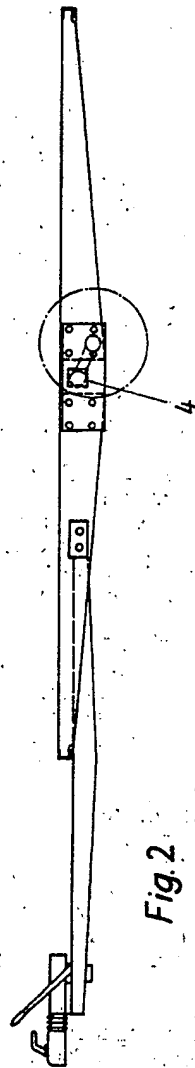


Fig. 2

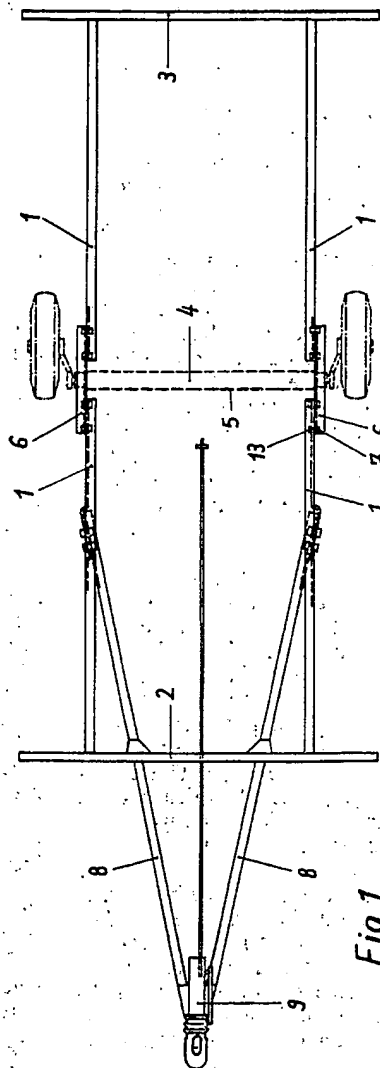


Fig. 1

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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale.

Sheet 2

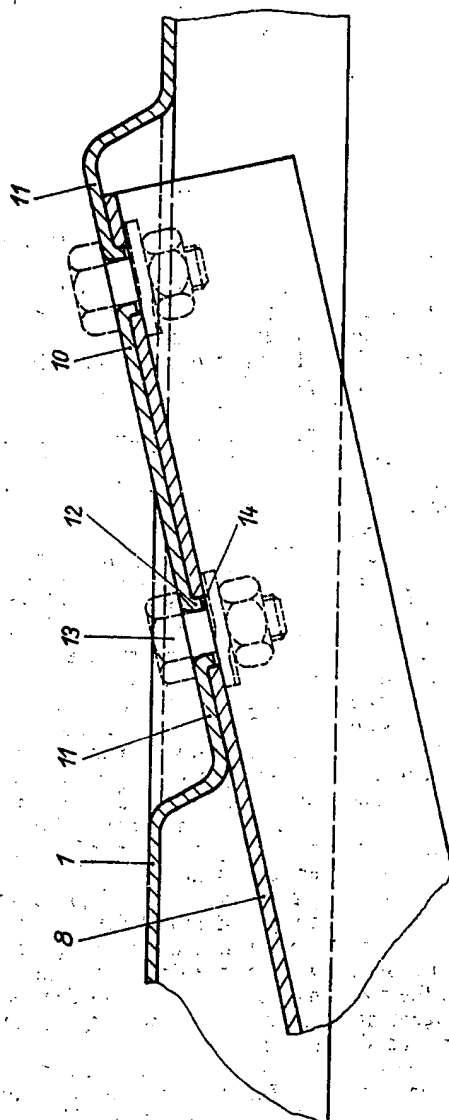


Fig. 3